WE CLAIM:

1. A method for removal of post reactive ion etch sidewall polymer rails on a Al/Cu metal line of a semiconductor or microelectronic composite structure comprising:

supplying a mixture of an etching gas and an acid neutralizing gas into a vacuum chamber in which said composite structure is supported to form a water soluble material of sidewall polymer rails left behind on the Al/Cu metal line from the RIE process; removing the water soluble material with deionized water; and removing photo-resist from said composite structure by either a water-only plasma process or a chemical down stream etching method.

2. The method of claim 1 wherein said composite structure comprises a silicon oxide interlayer dielectric, a barrier layer, a metal stack layer, and a photoresist layer.

3. The method of claim 2 wherein said etching gas is HF and said acid neutralizing gas is NH_3.

4. The method of claim 3 wherein removing said photo-resist accomplished at temperatures greater than 200°C.

5. The method of claim 1 wherein said mixture of said etching gas and said acid neutralizing gas is in the form of a plasma.

6. A method for removal of post ion etch sidewall polymer rails on a Al/Cu metal line of a semiconductor or microelectronic composite structure comprising:

forming a water-only plasma process to strip the photo-resist layer of a semiconductor or micro-electronic composite structure previously subjected to a RIE process;

supplying a mixture of an etching gas and an acid neutralizing gas into a vacuum chamber on which said structure is supported to form a water soluble material of sidewall polymer rails left behind on the Al/Cu metal line from the RIE process; and

removing the water soluble material with deionized water.

7. The process of claim 6, wherein the water-only plasma process is conducted at temperatures between about 175-275°C to limit the thickness of the sidewall polymer.

8. The process of claim 7 wherein said composite structure comprises a silicon oxide interlayer dielectric, a barrier layer, a metal stack layer, and a photo-resist layer.

9. The process of claim 8 wherein said etching gas is HF and said acid neutralizing gas is NH_3.

10. The process of claim 6 wherein said mixture of said etching gas and said acid neutralizing gas is in the form of a plasma.

11. An integrated metal etch tool operable to perform the method as recited in claim 6.

12. An integrated metal etch tool operable to perform the method as recited in claim 7.

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